

REMARKS

Claims 1 - 62 remain pending in this application. Claims 1, 24, 42 and 55  
5 have each been amended. No new matter has been added.

Applicants note that the Examiner has acknowledged that claims 12 – 21, 29  
– 33, 49 – 54, and 58 – 62 are directed to allowable subject matter.

10 The Office Action states that claims 1 – 62 stand “rejected under 35 U.S.C.  
112, second paragraph, as being indefinite for failing to particularly point out and  
distinctly claim the subject matter which applicant regards as the invention.”  
Applicants have amended claim 1, 24, 42 and 55 to provide antecedent basis for the  
term “surface”. In claim 1, line 3, Applicants have removed the term “about” to avoid  
15 the indefiniteness issues. Applicants have amended claim 1, 24, 42 and 55 to clarify  
that the 31% is by volume. Accordingly, Applicants respectfully request the  
withdrawal of the rejections under 35 U.S.C. 112 in view of the amendments made  
above.

20 The Office Action states that claims 1 – 11, 22 – 28, 34 – 36, 42 – 48 and 55 –  
57 stand “rejected under 35 U.S.C. 103(a) as being unpatentable over Weldon et al.  
(US 2003/0116276 A1) in combination with Tan (6,810,877).” The rejection is hereby  
traversed and reconsideration is respectfully requested.

Weldon et al. discloses methods for roughening a ceramic surface where structures called mechanical interlocks are formed in the ceramic surface through an etching process using a patterned mask composed of a metal. Upon forming the mechanical interlocks, the mask is removed by immersion into an HCl bath. (See 5 paragraphs 31 – 33). The problem Weldon et al. intended to solve is the premature delamination of an overlying layer of sacrificial material such as aluminum on a ceramic substrate, and the premature cracking of the ceramic substrate. The solution offered by Weldon et al. includes a process of modifying the surface of the ceramic substrate in a manner that enhances adherence of the overlying sacrificial layer to the 10 surface of the ceramic substrate, while minimizing surface damage that can facilitate premature cracking of the substrate.

Weldon et al. does teach the use of an acidic solution such as 37% HCl to remove the aluminum and the overlying tantalum deposits. However, Weldon et al. 15 fails to disclose an acid solution of up to 31% HCl by volume for a time to substantially remove the metallic layer therefrom as claimed by Applicants in Claims 1, 24, 42, and 55. Weldon et al. teaches that the sacrificial layer with overlaying tantalum deposits can be removed using conventional methods from the surface of ceramic substrates treated by Weldon et al., and specifically called out an acid 20 solution of 37% HCl as a suitable example for removing aluminum (See paragraph 54). There is no reason or motivation provided in the reference or the prior art for using an acid solution at the lower concentration ranges claimed by Applicants.

Tan discloses a method for cleaning semiconductor fabrication equipment parts, but fails to teach the immersion of a ceramic substrate coated with a metallic layer in an acid solution of up to 31% HCl by volume for a time to substantially remove the metallic layer therefrom as claimed by Applicants. Although Tan does 5 disclose that the prior art typically uses relatively high concentrations of acids and other cleaning agents to clean parts, there is no teaching as to the specific composition of Applicants' acid solution, nor to specific concentrations of the HCl. Instead, Tan teaches a cleaning formula comprising "a composition of high purity hydrofluoric acid (HF), nitric acid (HNO<sub>3</sub>), and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) in very dilute 10 quantities" (Col. 4, lines 4-6). Tan further discloses that the cleaning composition preferably "includes 0.5-1.5% wt. HF, 0.1-0.5% wt. HNO<sub>3</sub>, and 1-10% wt. H<sub>2</sub>O<sub>2</sub>."

Tan's use of 1 part nitric acid, 1 part hydrogen peroxide and 1 part HF composition is not usable in the present invention in that the composition results in a 15 chemistry that attacks the binder in the ceramic substrate, specifically the silicon and magnesium. This would destabilize the ceramic substrate, potentially causing failure in the semiconductor chamber. Accordingly, Tan teaches away from the present invention including avoiding the use of HCl altogether.

20 Weldon et al. is directed to a process for roughening the surface of a ceramic substrate to improve adherence of a sacrificial layer, while avoiding surface damage. Tan teaches a method for cleaning semiconductor fabrication equipment parts. Each of the references teaches solutions to different problems. One of ordinary skill in the art would not have been led to combine the relevant teachings of the applied

references in the proposed manner to arrive at the claimed invention. Moreover, Tan teaches away from Weldon et al. by avoiding the use of high concentration acid solutions. Accordingly, there is no reason or motivation to combine the cited references in the manner suggested by the Examiner.

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Claims 1, 24, 42 and 55 as currently amended are not anticipated or made obvious by the teaching of the references individually or in combination. More specifically, the cited references do not teach or even suggest using an acid solution of up to 31% HCl by volume. Nowhere in the references is the combination of 10 elements of Claims 1, 24, 42, and 55 (currently amended) taught or even suggested. Accordingly, Claims 1, 24, 42, and 55 as currently amended are patentable over Weldon et al. and Tan, individually or in combination. Claims 2-11, 22, 23, 25-28, 34-36, 43-48, and 56-57 are each dependent from one of Claims 1, 24, 42, and 55 as currently amended. Accordingly, claims 2-11, 22, 23, 25-28, 34- 36, 43-48, and 56-15 57 are patentable for at least the same reasons as the one of claims 1, 24, 42, and 55 (each currently amended), from which they depend.

Applicants would like to bring to the Examiner's attention that case law clearly supports their above discussion that Weldon et al. and Tan do not make Applicants' 20 invention as claimed obvious. More specifically, the courts have long held that there must be some teaching in the references cited to suggest the combination of the references in a manner to obtain the combination of elements of the rejected claim(s). It is well known that in order for any prior art references themselves to be validly

combined for use in a prior-art § 103 rejection, the references themselves, or some other prior art, must suggest that they be combined.

In view of the foregoing, Applicants submit that the present invention is in  
5 condition for allowance and early passage to issue is therefore deemed proper and respectfully requested. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

It is believed that no additional fee is due. However, if any additional fee is  
10 due, it should be charged to Deposit Account No. 23-0510.

Respectfully submitted,



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